

**IN THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**LISTING OF CLAIMS:**

- 1            1.        (canceled)
- 1            2.        (currently amended) The method of claim [[1]] 10 wherein the modulator  
2 is a phase modulator driven by a sinusoidal RF voltage.
- 1            3.        (currently amended) The method of claim [[1]] 10 wherein the modulator  
2 is a phase modulator driven by a train of square pulses.
- 1            4.        (currently amended) The method of claim [[1]] 10 wherein the optical  
2 signal is launched into the modulator having a polarization oriented at a predetermined  
3 angle such that the polarization of successive optical bits of the output signal are  
4 substantially orthogonal.
- 1            5.        (currently amended) The method of claim [[1]] 10 wherein the modulator  
2 is a Mach-Zehnder modulator including a polarization rotation device in at least one arm.
- 1            6.        (original) The method of claim 5 wherein the polarization rotation device  
2 is a half-wave plate.
- 1            7.        (original) The method of claim 5 wherein at least one arm of the  
2 modulator is driven by a sinusoidal RF voltage.
- 1            8.        (original) The method of claim 5 wherein at least one arm of the  
2 modulator is driven by a train of square pulses running at half the bit rate.

1           9.       (currently amended) A method of APol-PSK transmission comprising:  
2           using an electronic data signal to drive a Mach-Zehnder modulator having a  
3           polarization rotation device in at least one arm to provide simultaneous polarization  
4           alternation and optical data encoding by phase shift keying to generate an APol-PSK  
5           signal; wherein input signals to both arms of the Mach-Zehnder modulator have  
6           polarizations that are the same.

1           10.       (currently amended) A method comprising:  
2           precoding an electronic data signal;  
3           modulating the output of an optical source using the precoded electronic data  
4           signal and differential phase shift keying between two optical bits separated by an even  
5           number of bit periods to generate an encoded optical signal; and  
6           alternating the polarization of the encoded optical signal using a modulator such  
7           that successive optical bits have substantially orthogonal polarizations to generate an  
8           APol-DPSK signal; and  
9           demodulating the APol-DPSK signal using an even bit delay line interferometer.

1           11.       (canceled)

1           12.       (currently amended) A method of APol-DPSK transmission comprising:  
2           precoding an electronic data signal;  
3           using the precoded electronic data signal to drive a Mach-Zehnder modulator  
4           including a polarization rotation device in at least one arm to provide simultaneous  
5           polarization alternation and optical data encoding by phase shift keying between two  
6           optical bits separated by an even number of bit periods to generate an APol-DPSK signal;  
7           wherein input signals to both arms of the Mach-Zehnder modulator have  
8           polarizations that are the same.

1           13.       (original) The method of claim 12 wherein the polarization rotation device  
2           is a half-wave plate.

1           14.   (original) The method of claim 12 further comprising demodulating the  
2   APol-DPSK signal using an even bit delay line interferometer.

1           15.   (canceled)

1           16.   (canceled)

1           17.   (canceled)

1           18.   (canceled)

1           19.   (currently amended) The ~~apparatus~~ transmitter of claim ~~[[18]]~~ 25 wherein  
2   at least one arm of the modulator is driven by a sinusoidal RF voltage.

1           20.   (currently amended) The ~~apparatus~~ transmitter of claim ~~[[18]]~~ 25 wherein  
2   at least one arm of the modulator is driven by a train of square pulses running at half the  
3   bit rate.

1           21.   (currently amended) The ~~apparatus~~ transmitter of claim ~~[[15]]~~ 25 wherein  
2   the ~~polarization alternator is a~~ Mach-Zehnder modulator ~~having~~ comprises two  
3   complementary output ports, and wherein the ~~apparatus~~ transmitter further comprises a  
4   polarization beam combiner for combining outputs from the two output ports of the  
5   Mach-Zehnder modulator.

1           22.   (currently amended) The ~~apparatus~~ transmitter of claim 21 wherein at least  
2   one arm of the modulator is driven by a sinusoidal RF voltage.

1           23.   (currently amended) The ~~apparatus~~ transmitter of claim 21 wherein at least  
2   one arm of the modulator is driven by a train of square pulses running at half the bit rate.

1           24.   (canceled)

1           25.     (currently amended) An optical transmitter for APol-PSK transmission  
2 comprising:  
3           an optical source;  
4           a Mach-Zehnder (MZ) modulator device optically coupled to the laser source  
5 having a polarization rotation device in one arm; and  
6           drive circuitry coupled to the MZ modulator device to drive a MZ modulator to  
7 simultaneously provide polarization alternation and optical data encoding of an optical  
8 signal using phase shift keying;  
9           wherein input signals to both arms of the Mach-Zehnder modulator have  
10 polarizations that are the same.

1           26.     (currently amended) An optical transmitter for APol-DPSK transmission  
2 comprising:  
3           an optical source;  
4           a precoder;  
5           a Mach-Zehnder (MZ) modulator device optically coupled to the laser source  
6 having a half-wave plate in one arm; wherein input signals to both arms of the Mach-  
7 Zehnder modulator have polarizations that are the same; and  
8           drive circuitry coupled to the MZ modulator device to drive a MZ modulator  
9 using a precoded data signal from the precoder to simultaneously provide polarization  
10 alternation and optical data encoding of an optical signal using phase shift keying.

1           27.     (canceled)

1           28.     (previously presented) An optical transmission system for APol-PSK  
2 transmission comprising:  
3           an optical source,  
4           a modulator means having a polarization rotation device to provide simultaneous  
5 polarization alternation and optical data encoding by phase shift keying to generate an  
6 APol-PSK signal.

- 1           29.   (currently amended) An optical transmission system for APol-DPSK  
2 transmission comprising:  
3           an optical source;  
4           a precoder device for precoding an electronic data signal;  
5           an optical phase-shift-keying data modulator optically coupled to the laser source  
6 and driven by a precoded electronic data signal from the precoder device to produce an  
7 optical DPSK signal wherein electronic data to be transmitted is optically encoded by the  
8 data modulator as differential phase shift keying between two optical bits separated by an  
9 even number of bit periods; ~~and~~  
10          a polarization alternator optically coupled to the data modulator to provide  
11 polarization alternation of the output of the data modulator; and  
12          a demodulator comprising an even bit delay line interferometer.
- 1           30.   (canceled)